UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte TOR REGBERG, and
CHRISTEL ELLSTROM

Appeal No. 2005-1789
Application No. 09/869,023

ON BRIEF

ELLIS, SCHEINER and ADAMS, Administrative Patent Judges.

ELLIS, Administrative Patent Judge.

REMAND TO THE EXAMINER

This is an appeal pursuant to 35 U.S.C. § 134 of the examiner's final rejection of claims 1-8. Claims 9 and 10 are withdrawn from consideration. 37 C.F.R. § 1.142(b).

Claim 1 is representative of the subject matter on appeal and reads as follows:

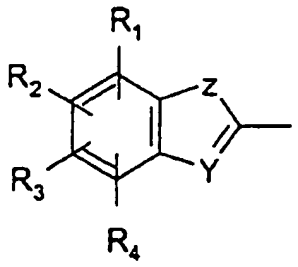
1. In a method for selectively enriching/removing a serum albumin from a mixture of other compounds by contacting said mixture with a ligand (= X), the improvement comprising said ligand

   a) having affinity for and enabling binding of the serum albumin and

   b) being attached via a spacer (= B) to a base matrix (= M') insoluble in the aqueous media used, the matrix with the attached ligand being represented by M-B-X

where M is the matrix, B is the spacer and X the affinity ligand, with the provision that M may contain further groups X linked via a spacer,

wherein said ligand X has been selected among serum albumin-binding structures complying with the formulae



in which

a) the free valence bind to the spacer B;

b) R_{1-4} are selected from hydrogen, electron-withdrawing groups, such as halogens and lower alkyl groups (C_{1-10}) that possibly are substituted with electron withdrawing groups, such as halogens;

c) Z and Y are selected among oxygen, sulphur or nitrogen, with the provision that the nitrogen may carry a positive charge.

The examiner does not rely on any references in the rejection of all the claims under 35 U.S.C. § 112, first paragraph, as being based on a non-enabling disclosure.

We have carefully considered the respective positions of both the appellants and the examiner and find that the issues have not been appropriately denominated. Accordingly, we remand the application to the examiner for further action consistent with this decision.

Discussion

As indicated by claim 1, above, the present invention is directed to a method of removing serum albumin from a mixture of other compounds. The method involves the use of "bicyclic compounds in which a five-membered heterocycle is fused with a benzene ring." Specification, p. 3. According to the specification, because the present method is selective in the removal of serum albumin, it results in a substantially pure preparation. Id.

The examiner argues that the specification only discloses fourteen (14) ligand structures within the scope of the claims. Answer, p. 3. The examiner further argues that "based on conventional ways of interpreting the chromatogram recorded, none of the ligand structures [# 3, 4, 6, 8, 9, 12 and 13] showed binding to IgG or HSA." Id. Thus, the examiner contends that given the teachings of the specification with respect to ligands # 3, 4, 6, 8, 9, 12 and 13, the claims are not enabled. Id. The examiner acknowledges that the specification discloses that ligands # 1, 2, 5, 7, 10, 11 and 14 interact with the media. Id. However, the examiner argues that the specification does not enable one skilled in the art to determine which other ligands within the scope of the claims are enabled because it [the specification] states that none of the ligands "appeared effective when analyzed by conventional methods," but only when "the appellants 'went further' than conventional analysis of chromatograms." Id. The examiner contends that the "specification does not provide guidance on how to conduct this 'further analysis.'" Id. Thus, the examiner concludes, inter alia, that given the

breadth of the claims, the unpredictable nature of the invention, the amount of guidance provided by the specification and the number of working examples, it would require undue experimentation for one skilled in the art to make and use the claimed methods "with ligands other than those the specification states are effective." Id., p. 4.

We appreciate the examiner's concerns with respect to the enablement issue; however, we find that the reasoning set forth in the rejection to be inconsistent with the facts of record and confused in the application of the law. For example, the examiner states that seven (7) ligands; viz., ligands 1, 2, 5, 7, 10 and 11, are enabled simply because the "specification demonstrates interaction with the media and there is no reason to doubt the accuracy of the specification." Answer, p. 3. The examiner then turns around and states the "efficacy" of the aforementioned ligands "was only determined when appellants 'went further' than conventional analysis of chromatograms . . . [and the] specification does not provide guidance on how to conduct this 'further analysis'" [emphasis added]. Id. Which is it? How do teachings of an unspecified "further analysis" of the seven aforementioned ligands in an HSA chromatogram enable one skilled in the art to "make and use" said ligands in the claimed method of enriching/removing a serum albumin from a mixture of compounds (claim 1) and not others? If the examiner does not "doubt the accuracy of the specification" with respect to the referenced ligands, then why doubt it with respect to other ligands within the scope of the claim?

Given the rejection before us, we think that the best course of action is to remand the application for reconsideration by the examiner in view of the following.

1. We point out that claim 1, the only independent claim, is directed to "a method for selectively enriching/removing a serum albumin from a mixture of other compounds by contacting said mixture with a ligand" having the claimed formula. Thus, since claims 2-8 are dependent on said claim, all of the claims on appeal include the second subsection (b) of claim 1 which states that the "R_{1-4} [of the formulae set forth therein] are selected from hydrogen, electron-withdrawing groups such as halogens and lower alkyl groups (C_{1-10}) that possibly are substituted with electron withdrawing groups, such as halogens" [emphasis added]. As a starting point in his disposition of the remand, the examiner should consider whether the claims clearly set forth the metes and bounds of the appellants' invention (In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971)); or whether they are indefinite in the recitation of "possibly are substituted with electron withdrawing groups." 35 U.S.C. § 112, second paragraph.

2. We point out that the method of claims 1-5, 7 and 8 is directed to the enrichment or removal of any [mammalian] serum albumin from a mixture of other compounds using ligands having the claimed formulae; whereas, claim 6 is particularly directed to the enrichment/removal of human serum albumin. According to the specification, ligands within the scope of the claims can be used to selectively remove any mammalian serum albumin from a solution containing a mixture of proteins such as

immunoglobulins or, if said albumin is expressed in bacteria, it can be removed from host cell contaminants. Specification, p. 1, paras. 1-2.

In this regard, the teachings of the specification are limited to fourteen (14) ligands and two types of serum albumin, human (HSA) and bovine (BSA). The specification discloses that under conventional analysis of the HSA chromatograms to test binding of the ligands in PBS at pH 7 (and elution with citrate at pH 3), none of the ligands bound to HSA. Specification, p. 16, para. 1. The specification explicitly states that the results were negative for all of the ligands. Id., line 5. However, the specification further states that the "inventors went further on and analyzed in more detail the shape and position of the peaks in the [HSA] chromatogram." Id., lines 6-7. Ligands 1, 2, 5, 7, 10, 11 and 14, are said to show "retardation of the peaks," "two peaks in the flow through," "peaks with a shoulder," or "retarded peaks that were tailed." Id., para. 2. As pointed out by the examiner, the specification provides no guidance as to what further steps were necessary to visualize the aforementioned peaks. Upon return of the application, the examiner should consider whether these teachings would have enabled one skilled in the art to "make and use" the claimed method using any of the disclosed ligands, let alone the additional ligands within the scope of the claims, without undue experimentation. That is, if the specification does not disclose how to visualize the binding of a ligand to a mammalian serum albumin, would said person have been able to determine whether a particular ligand selectively enriched or

removed any serum albumin from a mixture of other compounds, without undue experimentation?

In addition, is claim 6 enabled throughout its scope? As discussed above, claim 6 is directed to a method of using any ligand within the scope of the claims to enrich/remove human serum albumin from a mixture of compounds. The specification states that seven of the fourteen disclosed ligands were not able to bind HSA, of the remaining seven it is not clear what conditions were necessary to determine whether binding had occurred, and only one ligand is said to have bound under specific conditions (see section 3, below).

3. We find that the specification only describes one ligand, ligand 11, which is said to be capable of binding "all HSA applied and a part of the BSA applied" in West buffer at pH 4.6. According to the specification, HSA was eluted with PBS at pH 7; and "one portion/peak of BSA was eluted with West 4.6 and another with PBS at pH 7." Specification, para. bridging pp. 16-17. Thus, upon return of the application, the examiner should consider whether the specification provides sufficient guidance to enable one skilled in the art to determine conditions necessary for the various ligands within the scope of the claims to bind to different types of serum albumins, and whether said conditions are predictable.

4. We find that the specification does not provide any working examples of the isolation of any mammalian serum albumin from a mixture of other compounds using any of the ligands disclosed in the specification.

5. We recognize that the examiner tried to analyze the teachings of the specification in view of the factors set forth in In re Wands, 858 F.2d 731, 8 USPQ2d

1400 (Fed. Cir. 1988).[1] We agree that several of those factors are relevant in the present case; however, we do not agree with the manner in which they have been applied by the examiner. We believe that our findings with respect to the teachings of the specification outlined above should assist the examiner in (i) reapplying those factors to the facts of this case; and (ii) making a determination of whether it would require undue experimentation for one skilled in the art to make and use the claimed method. For example, it should be clear that the specification provides no working examples of the claimed method of removing a serum albumin from a mixture of other compounds using a ligand within the scope of the claims. At best, the specification only provides one example of a single ligand which is able to bind to HSA (which is not in a mixture with other compounds) under specific binding and elution conditions. Thus, with respect to the predictability factor, we urge the examiner to focus more on the predictability as to which ligand(s) are capable of removing which types of serum albumin (human, bovine, porcine, rodent, etc.), and which conditions are necessary for

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[1] We point out that it is well settled that the specification must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation. PPG Ind., Inc. v. Guardian Ind. Corp., 75 F.3d 1558, 1564, 37 USPQ2d 1618, 1623 (Fed. Cir. 1996); In re Wright, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993); and In re Vaeck, 947 F.2d 488, 495-96, 20 USPQ2d 1438, 1444-45 (Fed. Cir. 1991). That some experimentation is necessary is not fatal, the issue is whether the amount of experimentation required is undue. In re Wands, 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988); In re Vaeck, 947 F.2d at 495, 20 USPQ2d at 1444. To that end, the Federal Circuit has pointed out the factors to be considered in determining whether a disclosure would require undue experimentation in In re Wands, 858 F.2d at 737, 8 USPQ2d at 1404. Those factors include:

> (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

binding with each ligand/serum combination. How much guidance does the specification provide in this regard?

We are confident that given the guidance above, the examiner will be able to apply each of the Wands factors in an appropriate manner and make a well-reasoned determination, on the record, as to whether the teachings of the specification would have enabled one skilled in the art to make and use the claimed invention without undue experimentation. In re Wands, 858 F.2d at 737, 8 USPQ2d at 1404; In re Vaeck, 947 F.2d at 495, 20 USPQ2d at 1444.

Accordingly, in view of the foregoing, we remand the application to the examiner.

REMAND

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